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Angle Fractures and Third Molars

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ABSTRACT

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The aim of the study was to assess the position of 3rd molar as a predisposing factor in the fracture of the mandible at the angle. Out of 43 mandibular fractures at the angle, during a study from 2010-12 at Era's lucknow medical college and hospital, 38 (88.3%) cases had 3rd molar present while in 5(11%) cases it was absent. Amongst the 43 patients with angle fractures reported, out of 38 patients having third molars, 20(46.5%) were fully erupted, 11(25.5%) were vertically impacted, 2(4.6%) were horizontally impacted, 5(13.1%) were mesio-angularly impacted,. High prevalence was seen in the third decade i.e.46%. Male to female ratio was 7:1.

Key words: Angle Fracture, Impacted Third Molar

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INTRODUCTION

Mandibular fractures are common in the head and neck region; the reported rate of occurrence is 11.5 per 100,000 persons per year^[1]. Population between the ages of 16 and 30 years account for 50.2% of these fractures. Mandibular fractures follow a pattern common to many injuries in that males and young adults are predominantly affected. Fractures of the mandibular angle account for about 40% of mandibular fractures^[2]. Because the lower third molar is located near the angle of the mandible, it has been hypothesized that its presence increases the risk of fracture. Third molars are the last to erupt in the permanent teeth series. These teeth are the most vulnerable to be impacted^[3]. They occupy different positions and angulations in relation to anterior border of ramus and occlusal level of the second molar^[4]. Mandibular third molars produce complications, like infection, pain, malocclusion and are a weakening point to produce fracture at the angle^[5], when not fully erupted. Fracture at the angle of the mandible with a tooth in the line of fracture is more likely to become infected than at other sites^[6]. The relation of the third molar with

weakening of angle of mandible has been proved by the study of Ueno et al.^[7] Rietzik et al in a comparative study also concluded that un-erupted third molars are more significant in fracture of angle of mandible than the erupted third molar^[8]. Sinn et al reported that impacted and submerged third molar decreases the amount of bone support and weaken the angle of the mandible for the fracture to occur along the socket of the impacted tooth that extends inferiorly through the mandibular angle & this is the reason why angle is involved in 35% of the total maxillofacial injuries^[9].

METHODOLOGY

The study was conducted at the Department of Dentistry, Era's lucknow medical college and hospital, in Lucknow Uttar Pradesh. It was approved by the Ethics Committee of the institution. The sample comprised all patients with angle fractures attending the hospital from February 2012 to October 2012. An angle fracture was defined as a fracture located posterior to the second molar and extending from any point on the curve formed by the junction of the body of the mandible with the posterior border of the ramus^[10]. Children below 12 years and those who did not give consent were excluded. The diagnostic criteria was clinical examination and different views of extra oral and intra oral radiographs i.e. Orthopantomogram, Postero-anterior view &

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Occlusal view of mandible. CT scan was conducted wherever it was indicated.

RESULTS

The mean age of the 43 patients in this study was 28.6 years (range, 17-57 years). The largest percentage (48.5%) was in the 21-30 years age group. Thirty-eight patients (88.4%) were male and only 5 were female (11.6%). Of the 43 patients with angle fracture, in 24 (55.8%) it was on the right side and 19 (44.2%) on the left. More than half the patients (55.8%) had only angle fractures and in the others the angle fracture was associated with another mandibular fracture such as the mandibular body on the opposite side (9 cases), parasymphysis on the opposite side (5 cases), condyle (3 cases, 1 on the opposite side and 2 on both sides) and symphysis (2 cases). The majority of the cases with angle fracture had the third molar erupted followed by 41.9% of the patients with an impacted third molar (Table 1). As regards to the side, the left side had more impacted teeth than the right (52.6% x 33.3%). According to the classification of Winter, 65.8% of the teeth had a vertical angulation, followed by 28.9% with mesioangular

angulation and 11.1% in the horizontal position. (Graph1).

DISCUSSION

A number of factors contribute to the strength of the mandible, these include the presence of active and strong musculature, the shape and thickness of bone and the presence or absence of teeth. When resistance to fracture is considered, additional variables play a role in determining the site of fracture, including the exact point of application and the direction and severity of the impact force. Various authors have suggested that the angle of mandible forms an area of lowered resistance to fracture^[17]. Despite the consistency of the reported relationship between third molar and angle fracture, there exists a theoretical concern that the relationship may be spurious due to confounding. Specially, age may be a confounding variable as it is associated with both mandible fractures and third molar status^[13].

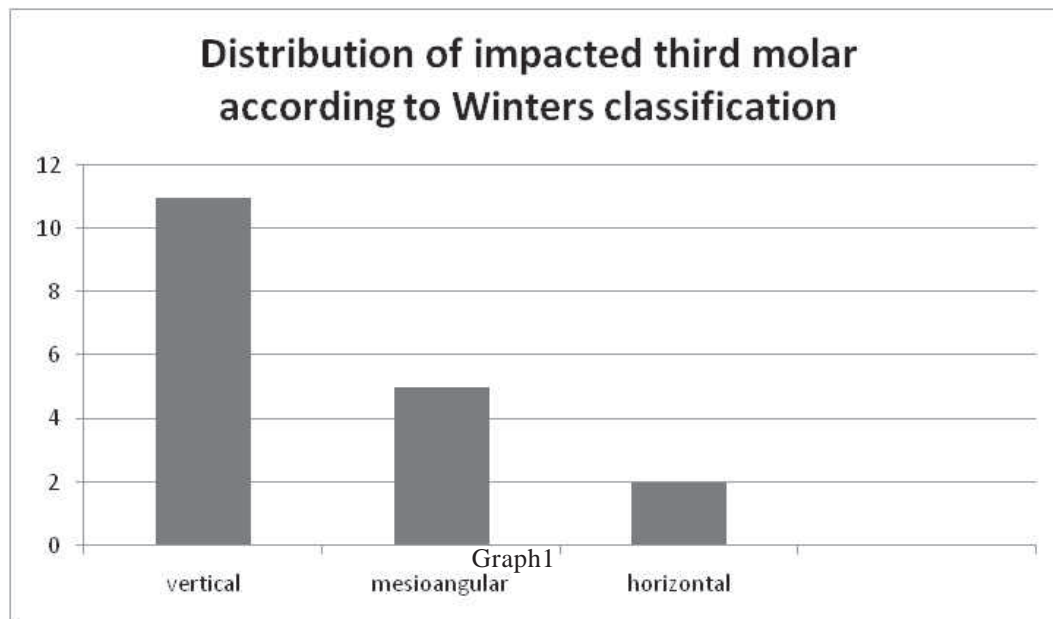
In this analysis, the results from 43 case series were analyzed to estimate that the risk of an angle fracture of the jaw in people with a lower third molar is

TABLE 1
(1): Using Fisher's Exact Test.

Angle fracture	Position of the third molar								
side	absent		erupted		impacted		Total		P value
	N	%	N	%	N	%	n	%	
Right	4	16.7	12	50	8	33.3	24	100	p(1) = 0.350
Left	1	5.3	8	42.1	10	52.6	19	100	

TABLE 2. Evaluation of the condition of the third molar
(1): Using Pearson's Chi-squared Test

Condition of the third molar	Angle fracture		
	N	%	
Impacted	18	41.9	p(1) = 0.001
Erupted	20	46.1	
Absent	5	11.6	p(1) < 0.001
Present	38	88.4	



approximately double that in people without a third molar. One mechanism by which third molars have been hypothesized to increase the risk of angle fractures is by occupying osseous space and, thereby, weakening the angle region. In support of that hypothesis, mandibular fractures have been reported to occur occasionally (at a very low incidence of 0.0046%) after wisdom tooth removal (when the angle region is weakened further because the tooth is extracted) when usual food is consumed.¹¹ In agreement with Halmos et al.¹³, the results of this study confirm the greater risk of angle fractures when the third molar is present. According to Winter's classification, the vertical angulation was more frequent, followed by mesioangular angulation, which is in agreement with Ma'aita et al.¹⁴ Thus, semi-impacted teeth whose greater crown diameter is found at the level of the external oblique ridge compromise the bone structure more than completely unerupted teeth and thus favor mandibular fracture.¹⁵ This structural involvement has also been demonstrated by Iida et al. who obtained statistically significant data showing that the closer the tooth to the mandibular basilar bone, the higher the prevalence of angular fractures. However, Iida et al.¹² did not observe any significant difference between the position of the third molar and the risk of angle fractures. In contrast, Lee et al did not observe that completely impacted teeth increase the relative risk of fracture compared to erupted third molars.¹⁶

CONCLUSION

The absence of an impacted third molar may decrease the prevalence of mandibular angle fractures.

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